

The woman who cracked the secret sex code of the Sumatran rhino and sired babies

● Third of a series

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THE Sumatran rhino's peculiar sexual physiology has confounded the best experts. Somehow the males and females just prefer to fight each other more than want sex except for a fleeting estrous moment that turns the female on.

Their aversion to sex has mystified everyone and may explain why only the Calcutta Zoo recorded the lone birth in captivity in history in 1889 and nothing for the entire century, until after Dr Terri L. Roth, Vice President at Cincinnati Zoo, decoded a deep seated secret that the female ovulates only after an actual physical touch of mating, summoned her extensive training in reproductive biology and the use of precision science such as hormonal assays, therapy and ultrasound to pin down that fleeting optimal magic moment to introduce the male and female when they would lock sex not horns!

In one single outbreak of insight, she crushed a slew of failures to score a historic success that rocked the rhino world with a sensational announcement of the first born male named Andalas in 2001 that made it to the front page of Daily Express, followed by a female calf Suci in 2004 and Harapan, another male in 2007, which stamped her authority as a world expert on natural breeding in captivity.

It also earned Cincinnati Zoo the reputation as the most successful facility in natural breeding of the Sumatran rhino. Terri went on to help Indonesia to breed Andatu - another male rhino baby in Way Kambas National Park, using Andalas, the first born male that she had sired, as the father!

This epic breakthrough has inspired a sense of deep confidence among rhino experts that science now holds the key to preserve a species that has arrived at the brink of extinction, and so Terri will remain a towering competent lead scientist in the thrust forward with natural breeding. So, even with a high 50 per cent to 70 per cent reproductive pathology inflicting the females, they don't think biology is the problem.

They are more unsure of the level of interest and the political will of the two range countries, Indonesia and Malaysia, not just in terms of supporting breeding programs but the acid test in protecting the actual forest habitats from which they come, not just recovery in zoos.

Plea to let go emotions, focus on the species and do it quickly

At the March 31 to April 4 Sumatran Rhino Crisis Summit at the Singapore Zoo, Dr Terri made an impassioned plea to the over 100 delegates to let go all political, personal, emotional, national feeling or even dislike against zoos to rally the critical mass of rhino experts in the world to focus on the primary, final, most important and the ultimate consideration - saving the species which is not only rapidly running out of space but also rapidly running out of numbers to an all time low at a global total of less than 100 - much less than previous estimates at more than 200.

The loud lesson from Mike Wallace - the Santiago Zoo master breeder who saved the Californian condo from the brink is this: Too many battles lost, don't lose the war!

Breed as many baby rhinos now and as fast as possible to build up a safeguarding population for science to do more. Don't wait.

Sabah certainly can't wait. From all accounts, the Tabin population in Sabah is



Andalas - the first born Sumatran rhino bred in captivity by Dr Terri at the Cincinnati Zoo is now a massive macho father of Andatu.



Suci - female Sumatran rhino bred by Dr Terri in 2004.



Harapan - the third Sumatran rhino which Dr Terri bred in captivity in 2008 at Cincinnati Zoo.

reportedly gone but hopefully not. Sabah is looking at about 10 to 14 wild individuals left in Danum Valley. But according to Datuk Dr Laurentius Ambu, Director of Wildlife Department, that is a figure from a survey 10 years ago.



Dr Terri shows her delight on Andatu, the fourth baby rhino she helped sire in Way Kambas National Park, Sumatra, using Andalas - as the father - the first baby born in captivity, which she succeeded in breeding at Cincinnati Zoo in 2001 Behind Andatu is his Mother, Ratu.

the moment? Just a small collection of captive population of 10 - Gelogog (too old and blind), Tam (low sperm count), Puntung (multiple cysts with damaged foot), Rosa, Bina, Ratu, Andalas, Suci, Harapan and Andatu - the last four are all related, noted Karen Dixon, Chairman of SOS Rhino. Indonesia has three or four populations in the wild - Way Kambas National Park, Bukit Barisan National Park, Gunung Leuser, Kalimantan but they are not all together, they are splintered and therefore reproductive pathology could be as high as 50 to 70 percent, Indonesian Sumatran rhino supremo, Widodo Ramono speculated.

Dr. Terri: It's a crisis, it's desperate

"We are looking at a crisis, we are desperate," Dr Terri emphasized to the gathering of experts.

So don't ignore what has actually worked, she said. Instead, acknowledge and support those individuals and facilities that have succeeded and not hold on to the animals and personnel unnecessarily.

She said she wanted to see follow-up, not shift gear like what happened to a 2009 agreement to treat the rhino as a global species and exchange animals but people changed that decision to moving gametes instead which doesn't help fertile females like Suci to conceive as she requires a successful physical mating first to ovulate. On her part, she says she'll keep going with the options that she knew had worked best at this moment in time to ensure the species doesn't run out of options eventually. "We have done all we can to help. We think it is huge that the Sumatra Rhino Foundation succeeded (in breeding Andatu, in the footsteps of Cincinnati), they are our partners, they have wonderful partners, they are doing a great job, we are continuing to help them with some other technologies but the facilities that has been most successful, the strategy that has been most successful, for the captive breeding portion of this whole effort (Cincinnati), is not getting any support," Terri said.

Decide for the most successful, do the opportunistic thing

Terri suggested that if the Summit were to decide to do captive breeding, it should make the right decision - the ones that are most likely to be successful and not based on something hypothetical that could be successful in 20 years but right now, it's not," she stressed.

"We need to do the opportunistic stuff, we need to store (genetic materials) but we can't rely on it right now for saving this Sumatran rhino," she argued.

"I look at the data, let's look at the data, look at what's best returns on investment, I look at the data all the time, the proven pair of animals (Emi and Ipuh) we had at Cincinnati, those animals made it 30 times (mating). Of those we only finished with three calves - 10 per cent success rate," she said. "Assisted reproduction is going to be lower than that, it's really higher in natural breeding, don't give up natural breeding. If we can do it, that should be our highest priority and then Assisted reproduction (artificial insemination) can be layered on top of that as an additional tool.

Oh well, what does the Sabah media stakeholder say?

Very sensible. Below, the Sumatran rhino wizard told her historic success story to Daily Express during the March 31 to April 4 Sumatran Rhino Crisis Summit held at the Singapore Zoo.

She took the world by storm as the famous vet

Daily Express: You took the world by storm as the famous vet who successfully bred four Sumatran rhino in captivity for the first time in 112 to 124 years between 2001 and 2012 but you actually failed many times initially. Can you tell us this monumental story of the 21st century?

Dr Terri Roth: Well, I can start from 1996.

That's when I arrived at the Cincinnati Zoo and there were three Sumatran rhinos there - one male and two females but no body knew how to breed them and at that point the captive program had not produced any pregnancies or offsprings.

So my approach was serious science - a lot of ultrasound work, hormone monitoring and observation and learn the reproductive trends of the female.

And by doing so, it took some time, a lot of details and within a year, we were able to get our first successful mating.

Shortly after that successful mating, I think it was on the second mating, she (Emi) actually conceived and because we could conduct the ultra sound examination, we can actually detect the pregnancy very early within 16

days after mating. So every body was very, very excited about the first pregnancy of course.

But at about 42 days after the pregnancy, she lost the embryo.

So she miscarried but we were enthused that we figured out how to breed them, we thought we knew what was going on, we figured we could do it again, we knew the male was fertile.

But she actually proceeded to lose a total of 5 pregnancies so the next four times she conceived she lost those as well which was a real roller coaster for a while.

We were so happy when she was pregnant but she kept losing them and always very early in the pregnancy.

And so the 6th time she conceived we put her on a hormone (progesterone) supplement.

We didn't know that was the problem, we didn't know that she needed the hormone but we had to do something at that point in time.

So, we put on the hormone supplement and that sixth pregnancy she carried all the way to term and delivered Andalas.

So Andalas was the first born in 112 years in captivity,

in 2001. **Sensational breaking news made banner headlines**

The sensational success hit banner headlines around the world, certainly in the Daily Express, because after a Sumatran rhino in the Calcutta Zoo India gave birth successfully in 1889, for the entire 20th century, not one Sumatran rhino was born in a zoo!

"We raised Andalas up and she (Emi) was a wonderful mother and then once he was about one-and-a-half years, he moved out to the Los Angeles Zoo and we mated Emi with our male rhino Ipuh several times and then she conceived, we did not give her the hormone supplement and she carried the second pregnancy to term all on her own, no more miscarriages," Dr Terri said.

"So it seems like getting into that first pregnancy really helped our system adjust and then the second pregnancy and the third pregnancy which followed that one she also carried on her own," Dr Terri said.

"So there was no hormone supplement for those."

"Emi delivered her second calf in 2004 and it was a female (Suci) and the third

calf (Harapan) was in 2007 and that was another little male.

"First, Andalas, second one Suci and a third one was Harapan and that (pointing to poster picture) was Andatu (sired in Way Kambas National Park, Sumatra with her help)."

"So in fact there are four but these are the three we produced in Cincinnati Zoo."

Returning Andalas to Sumatra - exemplary US-Indonesian partnership to save species

Dr Terri sired Andalas, Suci and Harapan with parent animals Emi and Ipuh which were originally sourced from Sumatra.

So, a very significant event that happened in Cincinnati Zoo in 2007 was the decision on Andalas, she said.

"We knew he was six years old, and probably getting close to being sexually mature and every body agreed that he should be sent to the Sumatra Rhino Sanctuary to serve as the breeding male for the facility," Dr Terri noted.

"At that time they were mating their old male and an old female multiple times and we suspected that the male was infertile," Dr Terri

recalled. "They really had a need to have a new, young, healthy, fertile male at the Sumatran Rhino Sanctuary."

"So, the Los Angeles Zoo moved Andalas all the way across the globe (63 hours by plane, truck and ferry) to Sumatra and he went through an adjustment period, we made sure he got used to all the new things - leeches, the ticks and things like that and then Dedi Candra (Chief Vet at Sumatran Rhino Sanctuary) slowly introduced him to the female at SRS and eventually, it took him a year and a half, may be two years, before they had their first mating and Ratu conceived," Dr Terri continued.

Dr Candra monitored Ratu's pregnancy weekly, conducted regular ultra sound exam using methods developed by Terri, while Terri prescribed a hormone given orally every day, provided the protocol and dosage.

"And so, that's Ratu, the female, she lost her pregnancy too."

"She miscarried just like our female (Emi) had. She did that twice and the third time we put her on the same hormone supplement we had used at Cincinnati and she car-



Dr Terri at Singapore Zoo.

ried to terms and delivered Andatu, which is that little guy (pointing to poster).

Daily Express: So it seems the hormone supplement is very important?"

Dr Terri: It appears to be a problem, hopefully she's carry a second one without the hormone supplement.

Daily Express: So you prefer it to be hormone-free?

Dr Terri: I like to be all natural if at all possible but they just seem to be having trouble with their first pregnancy for some reason.

Ultra sound captures precise moment when female rhino wants sex

Daily Express: You mentioned the importance of ultra sound. Why is it important?

Dr Terri: The ultra sound is actually how we time the

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